

PROSPECTUS

**2,200,000 shares**  
without par value

# **KEELEY-FRONTIER MINES LIMITED**

Incorporated in Ontario

**Transfer Agent and Registrar:**

CHARTERED TRUST COMPANY  
64 Wellington Street West  
Toronto, Ontario

The Company is offering for sale in Ontario through  
**ROSS, KNOWLES & CO. LTD., 25 Adelaide Street West, Toronto**  
or any registered securities dealer, to whom the Company will pay a commission,

**2,200,000 shares without par value**

**SUBSCRIPTION PRICE: 25¢ PER SHARE**

	Subscription Price	Commission Payable by Company	Proceeds to Company (1)
Per share.....	25¢	1½¢	23½¢
Total offering.....	\$550,000 (2)	\$33,000	\$517,000 (2)

(1) Before deducting expenses of the Company estimated at \$10,000.

(2) Assuming all shares offered are subscribed for.

**The date of this Prospectus is April 19, 1961**

NAME AND HEAD OFFICE  
**KEELEY-FRONTIER MINES LIMITED**

Room 1003, 67 Yonge Street  
Toronto 1, Ontario

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**CHARTER**

Incorporated as a mining company under the laws of the Province of Ontario by Letters Patent dated September 10th, 1959.

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**OFFICERS AND DIRECTORS**

MURDOCK CHARLES MOSHER.....	President and Director.....	168 Sandringham Drive, Toronto Prospector
FRANK HERBERT TODD.....	Vice-President and Director.....	3000 Yonge Street, Toronto Retired Insurance Agent
CHARLES ROGER ARCHIBALD, Q.C....	Director and Secretary-Treasurer..	45 Highland Avenue, Toronto Barrister and Solicitor
VAN HOOSE SMITH.....	Director.....	90 Strathallan Blvd., Toronto Metallurgist
ROBERT JAMES ASH.....	Director.....	49 Kirkland Street, Kirkland Lake, Ontario Merchant

Promoter: Murdock C. Mosher, above mentioned, caused the Company to be incorporated to acquire title to the properties referred to below.

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**AUDITORS**

Gunn, Roberts and Co., Chartered Accountants  
7 Queen Street East, Toronto, Ontario

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**REGISTRAR AND TRANSFER AGENT**

Chartered Trust Company  
64 Wellington Street West  
Toronto, Ontario

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No person has been authorized to give any information or to make any representations other than those contained in this Prospectus, and, if given or made, such information or representations must not be relied upon as having been authorized by the Company.

## CAPITAL

*Authorized:* 5,000,000 shares without nominal or par value.

*Issued:* 1,255,010 shares as fully paid and non-assessable.

*Escrowed:* Certificates for 1,000,000 shares are held in escrow by Chartered Trust Company, Toronto, until 30th of April, 1962, subject as to assignment, transfer, hypothecation or alienation within the escrow to the consent of the Ontario Securities Commission.

*Shares sold for cash:*

Shares	Cash Received
750,000 @ 10¢	\$75,000.00
10 @ \$1.00	10.00
<hr/> 750,010 shares	<hr/> \$75,010.00

No bonds or debentures are outstanding or proposed to be issued.

No securities other than shares have been sold to date or are now proposed to be issued.

There are no options or underwritings outstanding or now proposed to be given on shares of the Company's stock, but a further share offering in addition to the 2,200,000 shares offered hereby may be decided on at an early date to provide for the work programme to follow Phase One below mentioned.

Upon incorporation of the Company in September 1959, Mr. Mosher paid the Company \$10.00 for 10 shares subscribed by incorporators and purchased for investment 500,000 further shares at 10¢ a share for \$50,000 paid to the Company, of which 480,000 shares were purchased on behalf of himself, 10,000 on behalf of his wife and 5,000 on behalf of each of two daughters; the \$50,000 so subscribed was applied by the Company in part payment of the cost of mining properties below referred to. To discharge obligations for organization, administration, engineering and a \$10,000 cash payment for additional properties, the Company made a private offering to shareholders in May 1960 of 250,000 shares at 10¢ per share. The said shares were subscribed 243,000 by Mr. Mosher, 7,000 by his wife and daughters and not by any other shareholder. Of the shares purchased by Mr. Mosher 550,000 are held in escrow as aforesaid.

## THIS OFFERING

The Company is now offering for sale in Ontario through Ross, Knowles & Co. Ltd. or any registered securities dealer an aggregate of 2,200,000 shares without par value at a subscription price of 25¢ per share, out of which the Company will pay a commission of 1½¢ per share to the securities dealer through which the subscription is received, to yield a net price to the Company of 23½¢ per share. From the proceeds of the sale the Company will also defray the expenses of the offering, including printing, professional and other fees and expenses in relation to the prospectus and offering, which are estimated at approximately \$10,000.

As shown above, there are now issued and outstanding 1,255,010 shares, of which 1,000,000 shares are in escrow on the terms stated. In the event of the sale by any holder of free shares, or when released from escrow of any shares now escrowed, the proceeds thereof will enure to the benefit of the shareholder and not of the Company.

The proceeds of the shares now offered by the Company are to be applied substantially for the exploration and/or development of the Company's mining properties in the search for silver ores; the Company makes no claim as to the existence of such ores and in consequence the securities should be regarded as speculative.

## ACQUISITION OF PROPERTIES

**Holdings.** The Company has acquired and now holds a group of thirteen mining claims in South Lorrain Township, District of Temiskaming, Ontario, at the site of a former community known as Silver Centre. These lands comprise one contiguous block of 434.01 acres. Twelve of these claims (386.09 acres) are patented lands, the title to which is held in fee simple recorded in the name of the Company. The remaining claim, No. T 46400 (47.92 acres) at the north-east corner of the group, is an unpatented mining claim, title to which is registered in the name of the Company, subject to the provisions of The Mining Act of Ontario. Maps included with this prospectus illustrate the location and composition of the group, and the designation by claim numbers is set out below.

The fourteenth claim, H.R. 610 (34.2 acres) is a single claim located about a mile and a half south of the main group; title in fee simple is registered in the name of the Company.

**Vendors.** Of the above claims H.R. 19 and H.R. 21 (totalling 88.25 acres), sometimes referred to as "the Keeley property," were purchased from Anglo-Huronian Limited, 44 King Street West, Toronto, an Ontario company, for \$25,000, half paid by cash and half by issue of 125,000 shares at 10¢ per share.

Six mining claims H.R. 16, H.R. 17, H.R. 20, H.R. 25, H.S. 39 and H.R. 68 (totalling 148.8 acres) sometimes called the "Frontier property," were purchased from The Mining Corporation of Canada Limited, 44 King Street West, Toronto, a Canadian company, for \$50,000, half paid by cash and half by issue of 250,000 shares at 10¢ per share.

Three claims, H.R. 22, R.L. 455 and R.L. 456 (totalling 108.10 acres), sometimes called the "Keeley Extension property" and the isolated claim H.R. 610 (34.20 acres) were purchased from Keeley Extension Mines Limited, 44 King Street West, Toronto, an Ontario company, for \$25,000, half paid by cash and half by issue of 125,000 shares at 10¢ per share.

Ninety per cent of the shares issued to the above vendors are deposited in escrow as aforesaid.

The above property purchases were made in September 1959 and subsequently on 25th April, 1960, the Company purchased from Mr. Nathaniel Oslund of R.R. No. 1, Haileybury, Ontario, two unpatented claims, T 32960 and T 46400 (totalling 89.18 acres) sometimes called the "Oslund property," for \$10,000 cash and 5,000 shares of the Company issued at 10¢ a share; subsequently the Company has secured title in fee simple from the Crown to claim T 32960.

There is no person known to the Company to be entitled to receive from any of the vendors any interest in the considerations paid by the Company.

## THE MINING PROPERTIES

**Location.** The Company's property is situate in South Lorrain Township, south-east of Cobalt, a distance of some twenty-one miles by Provincial road, which parallels the shore of Lake Temiskaming. All the facilities of the Cobalt area as a main base for supplies, rail shipments, labour and housing are therefore readily accessible. A power line of the Ontario Hydro Electric Power Commission passes the property. Installation of a one and a half mile take-off line and substation by the Company will provide power at its proposed working site.

**History.** All of the component parts of the property have a long history, dating from the discovery of silver and cobalt in the general area at the beginning of this century.

Four of the mining claims forming the south-east corner of the Company's property are lands formerly operated by well-known silver producers, namely the "Keeley Mine" and the "Frontier Mine," which included the "Crompton." Extensive production of silver was derived from the Keeley property, claims H.R. 19 and 21, and also from the Frontier and Crompton Mines on claims H.R. 16 and 25. Mining and treatment plants stood on the claims and were operated by both the Keeley and Frontier companies. The Ontario Department of Mines' records show a production of silver between the years 1908 to 1931 inclusive from the Keeley aggregating 12,145,344 ozs., of which some 11,500,000 ozs. were produced in the nine-year period 1922 to 1930 inclusive; the Frontier is reported to have produced in excess of 6,000,000 ozs. Cobalt ores and concentrates were also produced from these two former mines, but any occurrence of cobalt that may be found is regarded by the Company as of secondary economic importance in the operations presently intended.

In the year 1931 both these mines closed down. No operations of significance in relation to the Company's present proposals are known to have been carried out since that date. The Keeley, Frontier and Keeley Extension property lying to the west has been held for many years by the respective vendors to the Company. All underground workings are flooded. The shutdown reports indicate that the salvable underground equipment was removed. All buildings and plant, machinery and equipment on the surface of the properties of such former operators were dismantled and removed excepting parts of the old mill building and headframe at the Keeley which apparently were not salvable, and were abandoned and allowed to become derelict.

**Geological Significance.** In respect of the former Keeley and of the former Frontier-Crompton mines, the properties therefore have a substantial history and have been the subject matter of numerous geological and other reports, largely government reports of public record. Such history and reports are now considered of interest principally to indicate the geological nature of occurrences of silver deposits in the area, and the prospects of finding new ore deposits hitherto undiscovered and unworked. A shutdown report on the former workings indicated several areas adjacent to the old workings thought to warrant exploration; these, however, are considered of minor consequence in relation to the present undertaking, investment and principal plan and purpose of the Company, which is to seek to find and open new breaks and structures in search for new ore deposits, unlocated and unworked. Exploration for such new deposits

is proposed along the Beaver Lake fault in the former "Keeley Extension property," at depth along the upper contact of the diabase sill, and at still greater depth below the diabase formation, or elsewhere in the unworked properties which the Company has acquired.

Other parts of the property, that is of the remaining nine claims of the group, are known to have been examined and explored but none are known to have operated as producing mines, nor to have been so examined as to disprove their potential. Claim T 46400 (one time patented as H.S. 40) was formerly known as the "Little Keeley Mine," and explored on two levels, it is believed to the extent of about 3,000 ft. of drifting along the northern extension of the Woods fault, without significant discoveries of silver.

The geological conditions of the area may give some potential to claim H.R. 610, which lies removed to the south from the main group. No significant work is planned to be undertaken on this claim at present.

Since acquisition by the Company in 1959 and 1960, there has been no work done other than land survey and minimum requirements of assessment work on one unpatented claim, and no plant or equipment has been installed.

**Engineer's Report.** Attached to this prospectus is a report on the properties by Leonard G. Smith, Professional Engineer, dated March 29, 1961, to which reference should be made for a professional opinion on geology, workings and mineral occurrences, and other matters concerning the properties, together with recommendations for a programme of exploration, and cost estimates.

**Proposed Programme of Work.** The Company proposes to carry out a programme of work in accordance with the engineering recommendations contained in Mr. Smith's aforesaid report, attached. As indicated therein, it is planned to gain access underground through the old workings, and notably through the Frontier shaft, which is of three compartments, for the purpose of underground geological examination and exploration and probably, in the first instance, for the construction of new development and/or mining ways and shafts. The development of new potential mining areas beyond formerly worked properties will require the installation of mining and surface plant. If warranted by the results, the purchase and erection of a milling plant and equipment would be undertaken as a subsequent phase.

The Schedule to Mr. Smith's report indicates the several phases by which the operation may be conducted and includes estimates for the first phase of the work, on the basis of which the Company now proposes to proceed.

## FINANCIAL

Preliminary and administrative expenses, since incorporation, are indicated on the attached financial statements as of February 28, 1961, attached to and forming part of this prospectus.

There is no indebtedness intended to be created or assumed not revealed by the financial statements as of February 28, 1961, attached to and forming part of this prospectus, or other than in connection with the present offering and proposed expenditures referred to above.

No dividends have been paid since incorporation, there having been no operations or earnings.

## INFORMATION CONCERNING DIRECTORS AND OFFICERS

The principal business in which each director and officer has been engaged for the past three years is as follows:

Murdock C. Mosher is a prospector. For some years, until March 1959, he was President and director of the field exploration of Lun-Echo Gold Mines Limited. Since incorporation of the Company in September 1959 he has been a director and President of the Company.

Frank H. Todd for many years owned and operated an insurance agency in the Town of Cobalt, and has been retired since 1958.

Van H. Smith is a metallurgist and carries on a consulting practice in the City of Toronto.

Robert J. Ash for many years was a Mine Accountant and for more than three years has been a merchant and a part proprietor of James Davis Hardware of Elliot Lake, Ontario.

C. Roger Archibald is a barrister and solicitor and a member of the legal firm of Roberts, Archibald, Seagram & Cole.

Mr. Mosher was a trustee and Mr. Todd a unit holder in a syndicate formed about 1942 to examine underground workings of the former "Little Keeley" property, claim H.S. 40; it is understood that a shallow shaft and upper level was dewatered, but no ore was found and the claim was sold for \$6,500; subsequently it reverted to the Crown for non-payment of taxes and was restaked by N. Oslund of Haileybury as claim T 46400, and in 1960 acquired by the Company as aforesaid. Otherwise no director or officer ever had any

direct or indirect interest in any of the properties, except to the extent that any of them ever had shareholdings in any of the public companies, former owners of parts of the properties, acquired by the Company from an individual and/or companies whose shares are publicly issued and distributed as referred to above under the heading "Acquisition of Properties."

No remuneration was paid by the Company to any director or officer as such during the last fiscal year; the Company paid certain fees to Messrs. Roberts, Archibald, Seagram & Cole, of which Mr. Archibald is a member, for legal, secretarial and administrative services performed for the Company. No remuneration is proposed to be paid to any director or officer during the current fiscal year other than fees for legal, secretarial and administrative services aforesaid, in accordance with the time and services involved.

Mr. Mosher, aforementioned, together with his wife and daughters, owns 750,000 shares purchased for investment, which shareholdings at the date hereof are sufficient to control the votes of a meeting, and put him in a position to elect or cause to be elected a majority of the directors of the Company.

There are no other facts considered to be material to the present offering not disclosed herein. There is no arrangement known to the signatories for the disposal of vendor shares.

The foregoing constitutes full, true and plain disclosure of all material facts in respect of the offering of securities referred to above, as required by Section 38 of The Securities Act (Ontario), and there is no further material information applicable other than in the financial statements or reports where required.

Dated this 19th day of April, 1961.

Signed,

"MURDOCK C. MOSHER"

*Director and Promoter*

"F. H. TODD"

*Director*

"VAN H. SMITH"

*Director*

"R. J. ASH"

*Director*

"C. R. ARCHIBALD"

*Director*

**KEELEY-FRONTIER MINES LIMITED**  
(Incorporated under the laws of the Province of Ontario)

**BALANCE SHEET**

**February 28, 1961**

**ASSETS**

**CURRENT ASSETS**

Cash..... \$ 7,002.96

**MINING CLAIMS**

Patented and unpatented mining claims in the Township of South Lorrain,  
District of Temiskaming, Ontario, acquired for \$60,000 cash and 505,000  
shares of the Company's capital stock valued at \$50,500..... 110,500.00

**OTHER ASSETS AND DEFERRED EXPENDITURES**

Equipment at cost..... \$ 359.00  
Exploration and administrative expenditures..... 5,176.89  
Organization expenses..... 3,071.15  

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8,607.04

\$126,110.00

**LIABILITIES**

**CURRENT LIABILITIES**

Accrued liabilities..... \$ 600.00

**SHAREHOLDERS' EQUITY**

Capital stock

Authorized—5,000,000 shares of no par value

Issued—

750,010 shares for cash..... \$75,010.00

505,000 shares for mining claims..... 50,500.00

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1,255,010 shares 125,510.00

\$126,110.00

Approved on behalf of the Board:

“Murdock C. Mosher,” Director

“C. R. Archibald,” Director

**AUDITORS' REPORT**

To the Directors of

Keeley-Frontier Mines Limited:

We have examined the balance sheet of Keeley-Frontier Mines Limited as at February 28, 1961 and the statement of exploration and administrative expenditures deferred from incorporation on September 10, 1959 to February 28, 1961. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion the accompanying balance sheet and statement of exploration and administrative expenditures deferred present fairly the financial position of the Company as at February 28, 1961 and the results of its operations for the period then ended, in accordance with generally accepted accounting principles.

GUNN, ROBERTS AND CO.,  
Chartered Accountants.

Toronto, Canada,  
March 28, 1961

# STATEMENT OF EXPLORATION AND ADMINISTRATIVE EXPENDITURES DEFERRED

From incorporation on September 10, 1959 to February 28, 1961

## EXPLORATION EXPENDITURES

Surveying and recording of claims.....	\$ 835.70	
Engineering and geological fees and expenses.....	1,882.50	
Assays.....	12.50	
		<u>\$2,730.70</u>

## ADMINISTRATIVE EXPENSES

Legal fees and expenses.....	\$ 500.00	
Taxes and licenses.....	153.19	
Stationery and printing.....	230.01	
Telephone.....	82.45	
Transfer agent's fees and expenses.....	341.13	
Travelling expense.....	1,021.36	
General office expense.....	118.05	
		<u>2,446.19</u>

Balance deferred December 31, 1960.....		<u>\$5,176.89</u>
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REPORT ON  
**THE KEELEY-FRONTIER MINES LIMITED**

SOUTH LORRAIN TOWNSHIP

PROVINCE OF ONTARIO

### **Introduction**

This report deals with properties of Keeley-Frontier Mines Limited in the South Lorrain District, sixteen miles southeast of Cobalt, Ontario. The Company's properties include the lands and workings of two former silver producers, the Keeley Mine and the Frontier Mine. It is proposed and hereby recommended that the Company should undertake an underground exploration programme, to be initiated through an existing shaft, and former workings, in search of silver in new and hitherto unexplored and unopened areas. Properties incorporated in the new company were formerly known as the Frontier Mine, this includes the Crompton, and the Keeley Mine; they also include the Keeley Extension.

### **Description of Property**

The properties of the Keeley-Frontier Mines Limited consist of thirteen mining claims in one contiguous block and one mining claim lying one mile and one-half south of the main group.

The recorded numbers of the mining claims in the one group are H.R. 16, 17, 19, 20, 21, 22, 25 and 68, and H.S. 39, and R.L. 455, 456 and T32960, all of which are patented, and one unpatented claim T46400. The area of this block approximates 430 acres and the relative location of these claims and their surface geology are shown on an accompanying map.

The isolated patented mining claim lying to the south of the main group is H.R. 610.

Access to the main group is by motor road from the Ontario Northland Railway at North Cobalt, a distance of twenty-one miles.

### **History**

Following the discovery of silver in 1903 and the early development in the Cobalt camp, where the silver deposits were found to have an association with the intrusive Nipissing diabase sill, prospecting was extended into the Elk Lake, Gowganda and South Lorrain areas where other occurrences of the Nipissing diabase had been recognized.

The first discovery of silver was made by the partners, J. M. Wood and R. J. Jowsey, on the original Keeley claim, H.R. 19, which was staked in September, 1907. It was named the Keeley after Charles Keeley who was associated with Jowsey and Wood.

After the discovery on the Keeley the South Lorrain camp became active and continued so until the latter part of the year 1913. During this period the South Lorrain camp produced approximately 2,500,000 ounces of silver from relatively small operations. In the next eight years there was little activity.

During World War I work was carried on only intermittently, and on the termination of this war operations on the two claims, H.R. 19 and 21, of Keeley Silver Mines Limited were resumed under the direction of the late Dr. J. Mackintosh Bell. To him is due the credit for the opening up of high-grade silver ore-shoots, in 1921, on the Wood's vein, and for the revival of interest in the South Lorrain camp. Up to the closing of the mine in the year 1931 the Keeley property produced 12,145,344 ounces of silver.

In August, 1921, Horace F. Strong of Haileybury discovered the first important high-grade ore at the Frontier Mine, immediately north of the Keeley. This property and the adjoining Crompton were turned over to the Mining Corporation of Canada, Limited and with parts of mining claims H.R. 16 and H.R. 25 were then mined until shutdown in 1931. This group is reported to have produced 6,637,111 ounces of silver.

### **Geology**

The Pre-Cambrian rocks of South Lorrain have been classified by A. G. Burrows in the Annual Report, Ontario Bureau of Mines, Vol. XIX, part II, 1913, and by C. W. Knight in Vol. XXXI, part II, 1922.

The oldest rocks are Keewatin basalts intruded by Haileyburian lamprophyre dikes. These were intruded by Algoman granite, followed by the deposition of the Cobalt sediments. Then came the intrusion of the Nipissing diabase sill, the most important geological feature of the South Lorrain silver camp.

The Nipissing diabase sill is described by C. W. Knight as having the shape of a great elongated dome, the longer axis of which strikes northeastward. The top of this dome has been eroded, leaving the two arms dipping away eastward and westward at angles varying from 15° to as high as 80° or 90°. Folding has been noted at the contacts, and some irregularities have been caused by doming and faulting. In the Keeley and Frontier Mine workings the sill has been shown to have a thickness of 910 feet.

The silver deposits of Cobalt, Elk Lake, Gowganda and South Lorrain are associated with the Nipissing diabase sill, but there are other controlling factors which are not similar in all these camps.

## Structural Geology

The Keewatin rocks in the Keeley and Frontier have been folded and faulted, intruded by lamprophyre dikes along fault lines, intruded by the diabase sill, and with the sill have been folded and faulted again.

It is believed that the veins were deposited during fracturing following the solidification of the diabase sill, and the fracturing occurred often along the contacts of the lamprophyre dikes. On the Keeley, the Wood's vein and No. 16 vein were faults occupied by lamprophyre dikes before the veins were formed. Mineralization of the veins was affected by the dikes in a zone near the contact of the sill with the Keewatin rocks.

The folding, faulting and fracturing that developed the vein systems of the Keeley and Frontier took place along the westerly dipping arm of the dome-shaped sill, and these occurred along east-west and north-south lines of compression. The vein material was deposited in open spaces and also by replacement where fracturing extended into the wall-rock.

What appeared to be an unusual pre-glacial oxidation along the Wood's vein in the Keeley took place near a heavily fractured area at the intersection of Wood's, 26 and 20 veins.

In addition to the intensity of fracturing, ore shoots in the Keeley and Frontier were caused by intersections of faults, intersections of veins, or intersections of barren fractures or shear zones with the veins.

Where first found, No. 16 vein in the Keeley was a narrow, barren fracture striking westward from the Wood's vein. A slash blasted out of the wall of the Wood's drift disclosed a calcite stringer. A drift round was then blasted exposing a calcite vein eight inches wide. Another drift round showed high-grade silver.

Silver production on the Keeley and Frontier came from an apparent favorable horizon extending from 400 feet above the upper contact of the diabase sill to about 150 feet below, but within this zone it is believed that structural conditions, and not contact proximity, are the major factors controlling the deposition of silver.

## Old Mine Workings

The recommended programme for new exploration to be carried out by the Keeley-Frontier Mines Limited will necessitate the dewatering of the old workings of the original Keeley and Frontier properties, which were quite extensive.

On the Keeley the main workings were those initiated by the development of and production from the Wood's vein, No. 16 vein and No. 28 vein, in addition to some minor development along other smaller veins and fractures.

Five shafts were put down during mining operations on the old Keeley property.

No. 1 shaft has a depth of 240 feet. It is connected to the main workings, but was dismantled and used only as a ventilating shaft and emergency exit.

No. 2 shaft was a prospect shaft 100 feet deep. It is not connected with any other workings.

No. 3 shaft has been the main working shaft. It has been sunk to a depth of 560 feet, with a sump below the 8th level. It has a hoisting compartment 3'7" x 4'4½" and a manway 3' x 4'4½". This shaft is timbered and is connected to all the levels excepting the 4th level, access to which is through a small winze on Wood's vein north.

Nos. 4 and 5 shafts were prospect shafts on Wood's vein and have been dismantled.

Underground, six winzes were sunk at various times but all of these were stoped out, or otherwise made useless, except for two, No. 828 winze and No. 830.

No. 828 winze is located at the junction of No. 16 and No. 28 veins on the 8th level, 850 feet west of Wood's vein. It extends from the 8th to the 11th level, an interval of 260 feet. This is a three compartment between the 8th and 9th levels, but over its entire length only two compartments were used. These were a hoisting compartment 3'3" x 4'3" and a manway 3' x 4'3" inside the timbers.

No. 830 winze, near the extreme south end of the property, is located on Wood's vein and extends from the 8th to the 10th level, a depth of 130 feet. This winze has only a hoisting compartment from the 8th to the 9th level, with a hoisting and manway compartment from the 9th to the 10th level.

On the Frontier the main workings were those initiated by the development of, and production from the Wood's vein, the Watson vein, and along other smaller veins and fractures.

The north-south vein structure, of which the Wood's and Watson veins were a part, extended north from the Frontier Mine into the claim T.46400, formerly H.S. 40 of the Little Keeley property. A shaft was sunk and exploration undertaken on two levels.

In the exploration of and production from the Wood's and Watson veins on the Frontier Mine, the main development was the sinking of the main Frontier shaft. This is a three compartment shaft having two hoisting compartments and a manway, all three openings having the same size, 4'5 $\frac{3}{4}$ " x 5' inside the timbers. It has been sunk to a depth of 610 feet down to the 8th level, and has a sump below this level. The Frontier shaft has a cement collar and is well timbered. Pumping out of the mine workings of Keeley-Frontier should be carried out through the Frontier shaft. It is believed this shaft will be found in good condition, with the timbers well preserved under water. It is recommended this shaft be used for access to the underground of both old mines and is probably the only present efficient means of reaching and exploring new and potentially valuable areas for finding silver deposits, which by reason of the nature of these occurrences cannot be satisfactorily located by diamond drilling from surface. The existing underground workings, however, provide the opportunity of putting out shorter, and more easily controlled as to direction, exploratory drill holes toward favorable objectives.

From the 8th level on the Frontier property a winze has been sunk to the 1420 foot horizon, and a drive extended south through the old Keeley property to explore the lower contact of the diabase sill. Some ore was produced from the lower contact, and it is believed this working will provide another locality for exploring for new silver ore shoots.

### **Ore Possibilities**

In assessing the ore potential of the Keeley-Frontier Mine the major consideration must be given to new ore that may be found under apparently favorable conditions in hitherto unexplored localities acquired by the Company, notably on the Keeley property along the productive zone west of the old Keeley workings, and on the former unexplored Keeley Extension. The discovery and development of ore in these two localities would constitute an entirely new mining operation.

While the ore in the old workings was considered to have been substantially exhausted under conditions prevailing at shutdown in 1931, it may be assumed that some ore will be found, in old stopes and drifts in the old Keeley and Frontier workings, that may be removed at a profit under the current price for silver. When these mines closed down the price for silver was under 30 cents per ounce as compared with the present price of approximately 90 cents an ounce. However, the ore remaining in these old workings must be considered as of minor importance and would not, of itself, warrant the de-watering and re-opening of the Keeley-Frontier Mine.

### **New Exploration**

When Dr. Mackintosh Bell found ore in the Wood's vein which led to the rejuvenation of the Keeley Mine, he expressed the theory that the Beaver Lake fault could be regarded as an extremely favorable structural feature, with possibilities for ore shoots similar to those found in the Wood's vein.

Located on the old Keeley Extension property, some 1,700 feet west of the Wood's vein, the Beaver Lake fault has approximately the same strike and dip. No systematic underground exploration has yet been undertaken along this strong break.

Another parallel break is indicated on surface approximately 700 feet west of the Beaver Lake fault. Several diamond drill holes were put down there in 1946, and one of these holes intersected the upper diabase contact at a depth of 1,140 feet.

The most favorable location for exploring the Beaver Lake fault appears to be directly west of the Keeley Mine workings, on the strike of the Keeley No. 16 and 28 veins in the productive zone above and below the upper contact of the diabase sill. This can be done by extending the present Keeley drifts westerly approximately 500 feet on the 10th, 11th and 12th levels.

Cross fractures or calcite stringers, along which cobalt bloom has developed, warrant further investigation. In the case of barren calcite veins, those having well developed cleavage seem to be more favorable for silver deposits. Abrupt changes in strike and dip of these veins have developed ore shoots.

Lamprophyre dikes, while not favorable to the deposition of silver, have occupied faults or fractures along which silver veins later formed.

Consideration should be given to further exploration at and below the lower contact of the diabase sill.

Nothing has been found to indicate that, in the Keeley-Frontier, silver occurs well within the diabase sill. However, should faults like the Beaver Lake fault and the Wood's fault persist strongly through the sill and encounter zones of conchoidal fracturing, such as are found in the diabase at Gowganda, then ore shoots of major importance might develop.

If the sinking of a new shaft on the Keeley Extension ever seems warranted, the shaft should be extended down through the productive zone in the Keewatin, and some distance into the upper part of the diabase sill. If new ore is developed from this shaft, a good exploratory bet would be to extend a cross-cut easterly, through the diabase sill, to connect with the old Keeley workings where ore was found along the lower contact.

Diamond drilling and some geophysical testing should prove useful aids in the finding of new ore on the Keeley-Frontier Mines.

### Acknowledgments

Credit for some of the information in this report is due to Dr. J. Mackintosh Bell, to C. W. Knight and to W. J. Dobbins, who was the manager of the Keeley Mine when operations were suspended in 1931.

In 1928 W. L. Whitehead, Mining Geologist of the firm of Glossop Whitehead and Boydell, made an examination and wrote a report on the Keeley Mine.

It has been the good fortune of the writer of this report to have worked under Dr. J. Mackintosh Bell at the Keeley Mine, and to have co-operated in a small way with C. W. Knight when he examined the Keeley prior to his writing the valuable report on South Lorrain for the Ontario Department of Mines.

In addition to the South Lorrain camp, the writer has worked in the silver areas of Cobalt, Gowganda, Elk Lake and Great Bear Lake.

Accompanying this report is a drawing of a vertical section through the Keeley workings along No. 16 and No. 28 veins and through the Keeley Extension property, showing a tentative location for a new shaft west of the Keeley. This is in accordance with Dr. J. Mackintosh Bell's original idea for the exploration of the Keeley Extension and the Beaver Lake Fault.

Respectfully submitted,

"LEONARD G. SMITH," P.Eng.

Toronto, Ontario  
March 29, 1961

( S E A L )

### Cost Estimates

The Company's programme of work may be considered in phases.

Phase One includes the dewatering and the initiation of underground exploration in the search for occurrences of silver. This will be directed to the areas indicated above, and be commenced by access gained through the Frontier Shaft and the old workings, to be opened by a short drive from the Frontier Shaft into the Keeley workings.

An exact estimate is not possible as to the time required to dewater the workings sufficiently to initiate useful exploration work, however, it has been estimated that five to six months might be required to dewater the old workings down to the diabase sill. The dewatering will probably extend to all underground workings on the Company's property and such parts of the former Trout Lake Mine to the south as may drain therein. However, it is believed that after the water level has been lowered, the Trout Lake workings may be dammed off and seepage from that mine prevented from flowing into the Keeley-Frontier operations. Well before dewatering has been completed it is anticipated that geological investigation, sampling and examination can be commenced from the upper horizons, and progressively increased as the water is lowered.

It is proposed to apply the moneys raised by the first offering to the first phase of the work, and to control the rate of work and expenditures in what appears to be the most economical manner. Funds now to be raised will permit an examination of only a small part of the total potential areas which have been recommended for exploration, and the direction of the exploration into these several areas will depend on the results progressively determined underground.

Assuming encouraging results from the first phase of work, it is contemplated that an extension of exploration and development work underground would be carried on, and it is considered advisable that at least \$200,000 be available for this purpose.

In the event that production is warranted, further plant and equipment will be required. Assuming silver occurrences are found generally similar in character to deposits previously worked in the South Lorrain area, it is expected that a certain portion of such ore would be of direct shipping grade and that other ore would require a concentrator and milling plant to be installed at the mine, the size of which cannot be estimated at this time.

The cost of the initial and subsequent phases will depend upon various factors and experience in the conduct of the work, including the rate of advance of dewatering. The following is an estimate of requirements for Phase One; all items being subject to variation for the above reasons.

#### Plant and Equipment Estimates

Electric power line, substation and incidentals.....	\$ 35,000
Mine buildings.....	30,000
Hoist, compressor, bulldozer, miscellaneous machinery, equipment, fittings, tools, etc.	100,000
Sub-total—plant, equipment, buildings.....	<u>\$165,000</u>

#### Operations Estimate

Dewatering.....	50,000
Diamond drilling, cross-cutting, slashing, sampling, assaying.....	130,000
Engineering, supervision, head office, travelling, administration.....	30,000
Supplies, incidentals.....	25,000
Contingencies or extension of work.....	100,000
TOTAL ESTIMATE.....	<u><u>\$500,000</u></u>

"LEONARD G. SMITH," P.Eng.

Toronto, Ontario,  
March 29, 1961

( S E A L )

### CERTIFICATE

I, L. G. SMITH, of the City of Toronto, in the Province of Ontario, hereby certify:

1. That I am a Mining Engineer residing at 10 Benvenuto Place, Toronto 7, and that my business address is  
Room 701,  
67 Yonge Street,  
Toronto 1.
2. That I am a registered Professional Engineer of the Mining Branch of the Province of Ontario. That I completed my third year in Mining and Geology at Queen's University, my course being interrupted by military service in World War I. That I have been practising my profession continuously since the end of that war.
3. That I have no direct or indirect interest whatever, nor do I expect to receive any, in the properties or securities of Keeley-Frontier Mines Limited.
4. That the accompanying report is based on government and private reports and information as set forth in the report, and on personal knowledge of the general area and of the Keeley Mine, where I was employed as Mining Engineer during the development of all the productive veins in that mine.

DATED at Toronto, Ontario, this 29th day of March, 1961.

"LEONARD G. SMITH"  
Professional Engineer.

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